JAN OLIVIER GRASDIJK

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Nationality	Dutch (The Netherlands)

RESEARCH INTERESTS AND TECHNOLOGY SPECIALTIES

- Employing atomic physics techniques (precise quantum control) to test fundamental symmetries of the Standard Model
- Perform Monte-Carlo simulations of atoms and molecules in time-varying electromagnetic and optical fields to simulate behaviour in conditions expected in the experimental apparatus
- Experimental data analysis (mid-size data sets, 10s GB)
- Design and construction of experimental setups to perform complex high precision measurements
- Design and programming of data acquisition and control systems
- Operation, maintenance and repair of various laser types (diode, fiber, ND-YAG, SHG)

WORK EXPERIENCE

2021- Postdoctoral Appointee, Argonne National Laboratory

Argonne National Laboratory

Postdoc on experiment to search for nuclear Schiff moment using 205Tl nuclei in thallium fluoride molecules. Atomic/Molecular Physics.

2018–2021 Postdoctoral Researcher, Yale University

Yale University

Postdoc on experiment to search for nuclear Schiff moment using 205Tl nuclei in thallium fluoride molecules. Atomic/Molecular Physics. Managing team of 3 graduate students. Performed simulations and data analysis with Python and Julia. Co-created the data acquisition software for the experiment in Python. Design of PCBs for various tasks in the lab, e.g. temperature control, signal amplification.

2014 Visiting PhD student, University of Mainz

University of Mainz

Working on the design, simulation and construction of the experimental setup to measure the electric dipole moment of ^{129}Xe.

2012 Script Developer, infohubble

infohubble

Using Selenium and jQuery to scrape data from websites for a database.

2010–2011 Student Assistant, University of Groningen

University of Groningen

Assistant for a first year Physics lab and mentor to a group of first year students.

2006–2009 Data Employee, ilocal

ilocal

Data spidering with Perl scripts for a search engine database.

EDUCATION

2013-2018 University of Groningen

PhD Physics

Thesis: *Search for the Permanent Electric Dipole Moment of* ^{129}*Xe*
Description: Experiment to find the electric dipole moment of ^{129}Xenon by tracking spin precession using SQUIDs. Research done at the University of Groningen, in collaboration with the universities of Mainz and Heidelberg and the Forschungszentrum Juelich.
Teaching Assistant for several Physics courses.
Worked on magnetic & electric field simulations, experimental setup design & construction, measurements and data analysis. Simulations and data analysis performed with Python and C. Performed extensive searches for spurious effects in the datasets.
Extracurriculars: Member of PhD Council, responsible for social events and finances. Organisation for PhD students of the Graduate School of Science and Engineering.

2011-2013 University of Groningen

MSc Physics

Thesis: *Search for the Permanent Electric Dipole Moment of* ^{129}*Xe*
Description: Experiment to find the electric dipole moment of ^{129}Xenon by tracking spin precession using SQUIDs. Research done at the KVI in Groningen, in collaboration with the universities of Mainz, Heidelberg and the PTB in Berlin.

2008-2011 University of Groningen

BSc Physics & Astronomy

Completed a dual Bachelors in Physics and Astronomy.
Thesis: *Production of a Beam of isomeric* ^{26}*Al for Astrophysical Research*
Description: Creation of a 26Al metastable beam at the AGOR cyclotron and Trimp magnetic separator facilities for astrophysical research purposes at the KVI in Groningen.
Honors: This research was submitted to the Dutch Student Research Conference and was subsequently selected for a presentation in Eindhoven.

PROGRAMMING LANGUAGES

Python, C, Matlab, Julia, Mathematica, LaTeX

Publications

HP-Xe to go: Storage and Transportation of hyperpolarized 129Xenon
Journal of Magnetic Resonance 265, April 2016, 197: 199
A gas cell for stopping, storing and polarizing radioactive particles
Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 882, June 2016, 77: 81
Test of Lorentz invariance in β decay of polarized ^{20}Na
Physical Review C 94, August 2016, 025503
Precise measurement of magnetic field gradients from free spin precession signals of ^{3}He and ^{129}Xe magnetometers
European Physical Journal D, April 2017, 71: 98
Electro-optic sensor for static fields
Applied Physics B 125, October 2019
CeNTREX: a new search for time-reversal symmetry violation in the ^{205}Tl nucleus
Quantum Sci. Technol. 6 044007, 2021

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